

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 26 SEP 2005

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Applicant's or agent's file reference A4-136PCT	FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/US2004/033636	International filing date (day/month/year) 12.10.2004	Priority date (day/month/year) 16.10.2003	
International Patent Classification (IPC) or national classification and IPC H01R12/08, H01R12/38, H01R12/16			
Applicant MOLEX INCORPORATED			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input checked="" type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 11.04.2005		Date of completion of this report 27.09.2005	
Name and mailing address of the International preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer Salojärvi, K Telephone No. +31 70 340-4036	



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2004/033636

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-9 as originally filed

Claims, Numbers

1-8, 10-17 received on 11.04.2005 with letter of 11.04.2005

Drawings, Sheets

1/9-9/9 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☒ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☒ the claims, Nos. 9
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☒ the claims, Nos. 1,10
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-8,10-17
Inventive step (IS)	Yes: Claims	
	No: Claims	1-8,10-17
Industrial applicability (IA)	Yes: Claims	1-8,10-17
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

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Re Item I

Basis of the report

AMENDMENTS, ART 19 PCT

- 1 The Applicant has filed the following amendments:
 - amendments in claims 1 and 10
 - deletion of claim 9
- 2 The amendments filed with the International Bureau under Article 19(1), concerning claims 1 and 10, introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 19(2) PCT. The amendments concerned are the following:
 - 2.1 According to amended claims 1 and 10 "the flexible contact arms having opposed first and second edges where the first edges are engageable by the cam portions of the actuator to bias the second edges of the contact arms into engagement with the flat circuit".
 - 2.2 In fact, the original application documents do not reveal any "first edges" of the flexible contact arms that would be engageable by the cam portions. According to the original description (page 7 lines 24-25) "each contact terminal includes an actuator section between the flexible contact arm and mounting section". The drawings support this statement accordingly.
- 3 Therefore, the international preliminary report on patentability is given as if these amendments in claims 1 and 10 were not filed, i.e. based on the original claims 1-8 and 10-17.

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

- 1 The following document is referred to in this communication:

D1 : US 2003/060072 A1

2 NOVELTY OF INDEPENDENT CLAIM 1

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

2.2 Document D1 discloses (the references in parentheses applying to this document):

An electrical connector (1) for connecting a flat electrical circuit (30) to a printed circuit board, comprising:

- a dielectric housing (5) having an opening at a front portion thereof for receiving an end of the flat circuit (30);
- a plurality of terminals (6, 20) mounted on the housing in a side-by-side array and spaced along the opening (see Fig. 1);
- an actuator (12) movably mounted for pivotal movement at a rear portion of the housing between an open position (Fig. 3-5, 9) allowing the flat circuit to be inserted into said opening and a closed position (Fig. 7, 8, 10) biasing at least some of the terminals against the flat circuit, the actuator having a cam portion with first and second cam surfaces;
- some of said terminals (6) comprising contact terminals having flexible contact arms (8) engageable by the first cam surface of the cam portion of the actuator to bias the contact arms into engagement with the flat circuit, and tail portions for connection to appropriate circuit traces on the printed circuit board; and
- some of said terminals comprising pivot/cam terminals having pivot means (23) to mount the actuator (12) for pivotal movement between said open and closed positions, and a cam surface for engaging the second cam surface of the cam portion of the actuator (see Fig. 2) to provide a back-up for the cam portion as the first cam surface of the cam portion biases the flexible contact arms of the contact terminals against the flat circuit.

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2.3 Consequently, the document D1 discloses all the features of claim 1. The subject-matter of claim 1 is therefore not new and the requirements of Article 33(2) PCT regarding novelty are not fulfilled.

3 NOVELTY OF INDEPENDENT CLAIM 10

The similar reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claim 10, which therefore IS also considered not new or inventive, see also document D1.

4 DEPENDENT CLAIMS 2-8 and 11-17

Dependent claims 2-8 and 11-17 do not appear to contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT), see also document D1.

5 INDUSTRIAL APPLICABILITY

The invention relates to an electrical connector. Consequently, it is obvious that the invention has industrial applicability.

CLAIMS

1. An electrical connector (22) for connecting a flat electrical circuit (24) to a printed circuit board, comprising:

a dielectric housing (26) having an opening (28) at a front portion (26a) thereof for receiving an end of the flat circuit;

a plurality of terminals (32,38) mounted on the housing in a side-by-side array and spaced along the opening;

an actuator (30) movably mounted for pivotal movement at a rear portion (26b) of the housing between an open position allowing the flat circuit to be inserted into said opening and a closed position biasing at least some of the terminals against the flat circuit, the actuator having a cam portion (30a) with first (30b) and second (30c) cam surfaces;

some of said terminals comprising contact terminals (32) having flexible contact arms (32c), with opposed first and second edges, the first edge engageable by the first cam surface (30b) of the cam portion (30a) of the actuator (30) to bias the second edge of the contact arms into engagement with the flat circuit, and tail portions (32b) for connection to appropriate circuit traces on the printed circuit board; and

some of said terminals comprising pivot/cam terminals (38) having pivot means (42) to mount the actuator for pivotal movement between said open and closed positions, and a cam surface (38g) for engaging the second cam surface (30c) of the cam portion of the actuator to provide a back-up for the cam portion as the first cam surface (30b) of the cam portion biases the flexible contact arms of the contact terminals against the flat circuit.

2. The electrical connector of claim 1 wherein said pivot means of the pivot/cam terminals (38) comprise a pivot socket (42) for receiving the cam portion (30a) of the actuator (30) to pivotally mount the actuator for movement between said open and closed positions.

3. The electrical connector of claim 2 wherein said cam surface (38g) on the

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pivot/cam terminals (38) is defined by one side of the pivot socket (42).

4. The electrical connector of claim 2 wherein said pivot socket (42) has an open mouth (42a) to allow the cam portion (30a) of the actuator (30) to be positioned therein when the actuator is assembled to the housing (26) in its open position.

5. The electrical connector of claim 4 wherein said contact terminals (32) have blocking portions (32f) to prevent the cam portion (30a) of the actuator (30) from pulling out of the pivot socket (42) when the actuator is in its closed position.

6. The electrical connector of claim 5 wherein said cam portion (30a) of the actuator (30) has a narrow dimension in cross-section and a wide dimension generally perpendicular to the narrow dimension, whereby the narrow dimension can pass through the mouth (42a) of the pivot socket (42) when the actuator is in its open position, and the blocking portions (32f) of the flexible contact terminals (32) prevent the wide dimension from moving out of the mouth when the actuator is in its closed position.

7. The electrical connector of claim 1 wherein the flexible contact arms (32c) of said contact terminals (32) engage one side of the flat circuit, and said pivot/cam terminals (38) include generally rigid contact arms (38b) for engaging an opposite side of the flat circuit along with tail portions (38d) for connection to appropriate circuit traces on the printed circuit board.

8. The electrical connector of claim 7 wherein said pivot/cam terminals (38) are rigidly mounted at a bottom of the housing (26) such that the rigid contact arms (38b) are engageable with a bottom side of the flat circuit, and said contact terminals (32) are mounted on the housing with the flexible contact arms (32c) located at a top of the housing for engaging a top side of the flat circuit.

10. An electrical connector (22) for terminating a flat electrical circuit (24), comprising:

a dielectric housing (26) having an opening (28) for receiving an end of the flat circuit;

a plurality of terminals (32,38) mounted on the housing in a side-by-side array and spaced along the opening;

an actuator (30) movably mounted on the housing for movement between an open position allowing the flat circuit to be inserted into said opening and a closed position biasing at least some of the terminals against the flat circuit, the actuator having a cam portion (30a);

some of said terminals comprising contact terminals (32) having flexible contact arms (32c), with opposed first and second edges, the first edge engageable by the cam portion of the actuator to bias the second edge of contact arms into engagement with the flat circuit; and

some of said terminals comprising pivot/cam terminals (38) having pivot means (42) to mount the actuator for pivotal movement between said open and closed positions, and a cam surface (38g) for engaging the cam portion of the actuator to provide a back-up for the cam portion as the cam portion biases the flexible contact arms of the contact terminals against the flat circuit.

11. The electrical connector of claim 10 wherein said pivot means of the pivot/cam terminals (38) comprise a pivot socket (42) for receiving the cam portion (30a) of the actuator (30) to pivotally mount the actuator for movement between said open and closed positions.

12. The electrical connector of claim 11 wherein said cam surface (38g) on the pivot/cam terminals (38) is defined by one side of the pivot socket (42).

13. The electrical connector of claim 11 wherein said pivot socket (42) has an open mouth (42a) to allow the cam portion (30a) of the actuator (30) to be positioned thereinto when the actuator is assembled to the housing (26) in its open position.

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14. The electrical connector of claim 13 wherein said contact terminals (32) have blocking portions (32f) to prevent the cam portion (30a) of the actuator (30) from pulling out of the pivot socket (42) when the actuator is in its closed position.

15. The electrical connector of claim 14 wherein said cam portion (30a) of the actuator (30) has a narrow dimension in cross-section and a wide dimension generally perpendicular to the narrow dimension, whereby the narrow dimension can pass through the mouth (42a) of the pivot socket (42) when the actuator is in its open position, and the blocking portions (32f) of the flexible contact terminals (32) prevent the wide dimension from moving out of the mouth when the actuator is in its closed position.

16. The electrical connector of claim 10 wherein the flexible contact arms (32c) of said contact terminals (32) engage one side of the flat circuit, and said pivot/cam terminals (38) include generally rigid contact arms (38b) for engaging an opposite side of the flat circuit.

17. The electrical connector of claim 16 wherein said pivot/cam terminals (38) are rigidly mounted at a bottom of the housing (26) such that the rigid contact arms (38b) are engageable with a bottom side of the flat circuit, and said contact terminals (32) are mounted on the housing with the flexible contact arms (32c) located at a top of the housing for engaging a top side of the flat circuit.